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NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON
NATIONAL DAM SAFETY PROGRAM. SCHILLER POND DAM (NJ00153), DELAW--ETC(U)
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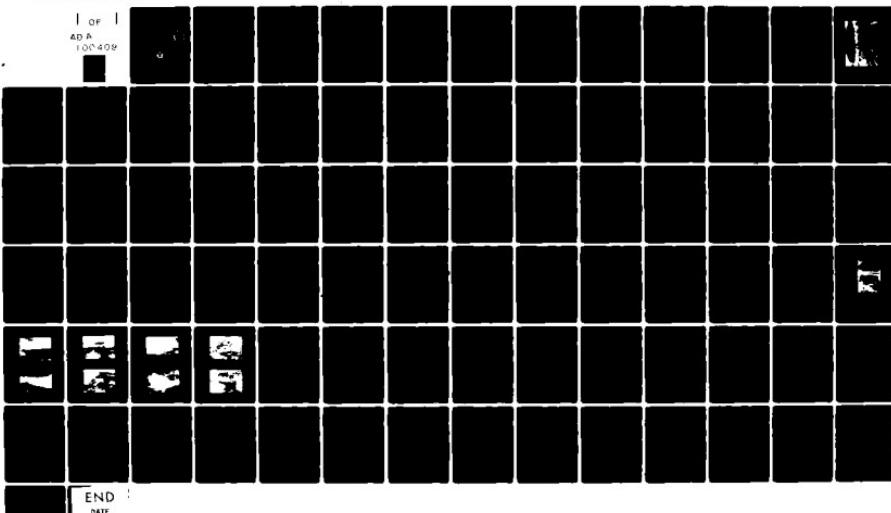
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TRIBUTARY ALEXAUKEN CREEK,
HUNTERDON COUNTY
NEW JERSEY

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SCHILLER POND DAM

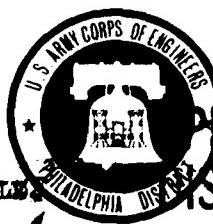
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PHASE 1 INSPECTION REPORT NATIONAL DAM SAFETY PROGRAM



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DEPARTMENT OF THE ARMY

Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

REPT. NO: DAEN(NP)-53842/NJ00153-81/05

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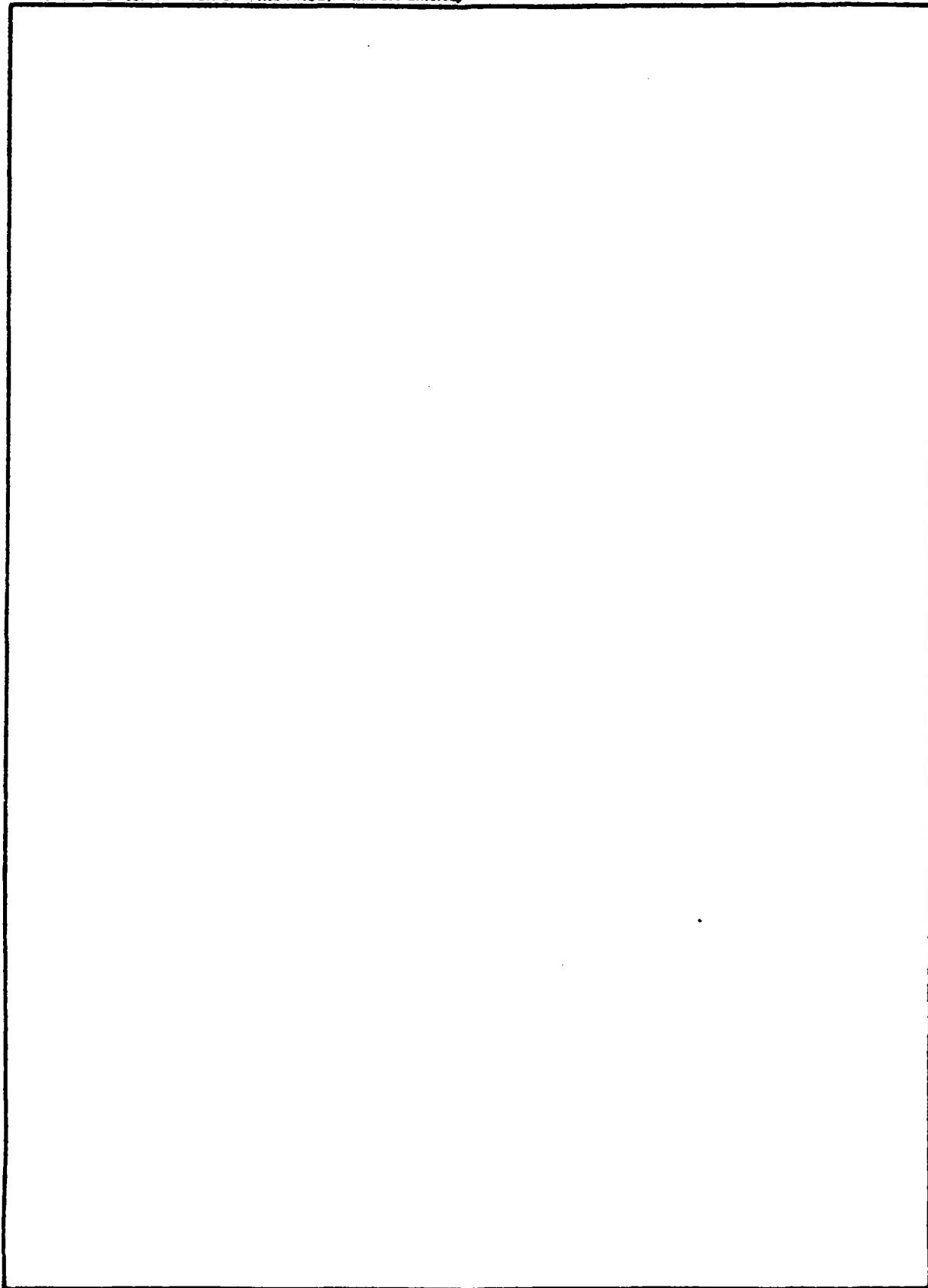
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.		

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" 5 JUN 1981

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

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Dear Governor Byrne:

Enclosed is the Phase I Inspection Report for Deer Head Lake Dam in Ocean County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief executive summary of the dam's condition is given at the front of the report.

Based on visual inspection, available records, certifications and past operational performance, Deer Head Lake Dam, a high hazard potential structure, is judged to be in good overall condition. The dam's spillways are considered inadequate because a flow equivalent to eight percent of the Spillway Design Flood - SDF - would cause the dam to be overtopped. (The SDF, in this instance, is one half of the Probable Maximum Flood). The decision to consider the spillways "inadequate" instead of "seriously inadequate" is based on the determination that dam failure resulting from overtopping would not significantly increase the hazard to loss of life downstream from the dam from that which would exist just before overtopping failure. To ensure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillways' adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Within three months of the consultant's findings remedial measures to ensure spillway adequacy should be initiated. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around the clock surveillance should be provided.

b. Within twelve months from the date of approval of this report, the following remedial actions should be completed:

- (1) Repair the stiltting basin of the left spillway with epoxy cement.

APPENDIX

APPENDIX A - REPORT

The following is a copy of the report of the inspection of the New Jersey Department of Environmental Protection's Division of Water Resources.

This inspection was conducted on March 1, 1988, at the offices of the Division of Water Resources, 200 Morris Avenue, Trenton, NJ 08625. The inspection was conducted by the Bureau of Flood Plain Regulation, Division of Water Resources.

The inspection was conducted to determine if the Division of Water Resources is in compliance with applicable laws and regulations.

The inspection was conducted by the Bureau of Flood Plain Regulation, Division of Water Resources.

The inspection was conducted to determine if the Division of Water Resources is in compliance with applicable laws and regulations.

A copy of the report is being transmitted to Mr. James R. Homan, New Jersey Department of Environmental Protection, the designated state liaison contact for this program. Within five days of receipt of this letter, a copy will also be sent to the Office of Inspector General of the Second Circuit. Under the provisions of the Freedom of Information Act, the inspection report will be subject to release by the Office, upon request, 10 years after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Service (NTIS), Springfield, Virginia, paid at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the firm inspection program will be the implementation of the recommendations made as a result of the inspection. We respectfully request that we be advised of proposed actions taken by the State to implement our recommendations.

Very truly yours,

James R. Homan

James R. Homan

Division of Water Resources

New Jersey Department of Environmental Protection

Incl

as stated

cc'd to:

Mr. Dick G. Norton, P.E., Dept. of Environment
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN021
Trenton, NJ 08625

Mr. John O'Donnell, Acting Director
Bureau of Flood Plain Regulation
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN021
Trenton, NJ 08625

APPENDIX A - APPROVALS

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1. Approval of the proposed dam site and the proposed dam by the New York State Department of Environmental Conservation, Division of Water Resources, Bureau of Dams, and the New York State Office of General Services, Bureau of Public Works, Division of Water Resources, Bureau of Dams.

2. Approval of the proposed dam site and the proposed dam by the New York State Department of Environmental Conservation, Bureau of Water Resources, Bureau of Dams, and the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

3. Approval of the proposed dam site and the proposed dam by the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

a) The spillways and gates should be determined by a qualified hydraulic engineer by the owner during more sophisticated planning procedures and studies within six months from the date of approval of the project. A maintenance manual for the concrete structures required in connection with the proposed dam should be submitted. In the interim, a reliable emergency operation plan and warning system should be prepared, and, also, during periods of unusual heavy precipitation, forward flood warnings should be provided.

b) Within one year after the day of approval of this report, the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

c) Within one year after the day of approval of this report, the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

d) Within one year after the day of approval of this report, the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

e) Within one year after the day of approval of this report, the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

f) Within one year after the day of approval of this report, the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

g) Within one year after the day of approval of this report, the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

h) Within one year after the day of approval of this report, the New York State Office of General Services, Bureau of Public Works, Bureau of Water Resources, Bureau of Dams.

APPENDIX A

KENNETH R. MOSER

Major, Corps of Engineers
acting District Engineer

July 1961

DELAWARE RIVER BASIN
TRIBUTARY ALEXAUKEN CREEK, HUNTERDON COUNTY
NEW JERSEY

SCHILLER POND DAM

(NJ00153)

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

14-11

DEPARTMENT OF THE ARMY

PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
PHILADELPHIA, PENNSYLVANIA 19106

MAY, 1981

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name: Schiller Pond Dam, I.D. NJ 00153
State Located : New Jersey
County Located: Hunterdon County
Stream : Tributary Alexanken Creek
River Basin: Delaware River
Date of Inspection: January 13, and February 3, 1981

Assessment of General Conditions

Schiller Pond Dam is an earthfill dam with a concrete drop inlet, the main spillway, in the center of the dam. In addition there is an auxiliary spillway at the right end of the dam. The overall condition of the dam is good. There are no signs of distress or instability in the embankment. The downstream channel is well defined and in good condition. The low-level outlet was not opened and is not used. The hazard potential is rated as "high".

Schiller Pond Dam is considered inadequate in view of its lack of spillway capacity to pass the SDF (1/2 PMF) without overtopping the dam. The spillway is capable of passing a flood equal to 35 percent of the PMF (70 percent of the 1/2 PMF), and is assessed as "inadequate".

At present, the engineering data available is not sufficient to make a definitive statement on the stability of the dam, but based on the findings of the visual inspection, the preliminary assessment of static stability is that it is satisfactory. The following actions are recommended along with a timetable for their completion. All recommended actions should be conducted under the supervision of an Engineer who is experienced in the design, construction and inspection of dams.

1. Carry out a more precise hydrologic and hydraulic analysis of the dam within twelve months, to determine the need and type of mitigating measures necessary. Based on the results of these studies, remedial measures should be instituted. This should include the installation of a tailwater gage.
2. Construct a concrete headwall and apron at the outlet end of the discharge pipe within twelve months.

3. The trees should be removed from the embankment slopes to avoid problems that may develop from roots. The area should then be seeded to develop a growth of grass for surface erosion protection. This should be done within twelve months.
4. Determine if the low-level outlet gate is operable, and if not institute remedial action to make it operable within twelve months.
5. The owner should develop an emergency action plan (if one is not already available) outlining actions to be taken by the operator to minimize downstream effects of an emergency and establish a flood warning system for the downstream communities within three months.

Furthermore, while of a less urgent nature, the following additional action is recommended and should be carried out within twelve months.

The owner should develop, within one (1) year after formal approval of the report, written operating procedures and a periodic maintenance plan to insure the safety of the dam.



John P. Talerico, P.E.
HARRIS-ECI ASSOCIATES



Photo taken January 13, 1981

S C H I L L E R P O N D D A M

View of dam looking towards the auxiliary spillway.
Main spillway is drop inlet in right center of photo.

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the office of the Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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ASSESSMENT OF GENERAL CONDITIONS

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

SCHILLER POND DAM, I.D. NJ 00153

SECTION 1

1. PROJECT INFORMATION

1.1 General

a. Authority

The National Dam Inspection Act (Public Law 92-367, 1972) provides for the National Inventory and Inspection Program by the U.S. Army Corps of Engineers. This inspection was made in accordance with this authority under Contract C-FPM No. 35 with the State of New Jersey who, in turn, is contracted to the Philadelphia District of the Corps of Engineers, and was carried out by the engineering firm of Harris-ECI Associates of Woodbridge, New Jersey.

b. Purpose of Inspection

The visual inspection of Schiller Pond Dam was made on January 13 and February 3, 1981. The purpose of the inspection was to make a general assessment as to the structural integrity and operational adequacy of the dam embankment and its appurtenant structures.

c. Scope of Report

The report summarizes available pertinent data relating to the project; presents a summary of visual observations made during the field inspection; presents an evaluation of hydrologic and hydraulic conditions at the site; presents an evaluation as to the structural adequacy of the various project features; and assesses the general condition of the dam with respect to safety.

1.2 Description of Project

a. Description of Dam and Appurtenances

Schiller Pond Dam is an earthfill dam approximately 300 feet long and 18.5 feet high with a clay cut off trench. There are two spillways, an 8-foot by 6 foot concrete drop inlet which is the main spillway and a 60 foot wide grass covered auxiliary spillway. The auxiliary spillway, which was constructed by excavating the existing ground, is located at the right end of the dam. Its crest is 4.0 feet below the top of the embankment. The drop inlet is located approximately 150 feet from the left edge of the auxiliary spillway and its crest is 6.5 feet below the top of the embankment.

There is a wire screen on top of the inlet to keep the trout from going into the discharge during high pond levels. The flow from the drop inlet discharges into the downstream channel through a 72-inch corrugated metal pipe, which has two anti-seep collars extending three feet beyond the outside of the pipe. The flow from the auxiliary spillway runs perpendicular to the dam along the discharge channel for approximately 80 feet and then flows to the left along the existing ground to the downstream channel.

The embankment has a top width of 10 feet with a 3H:1V slope on the upstream face and approximately a 4H:1V slope on the downstream face.

The low-level outlet consists of a 72-inch corrugated metal pipe that carries the flow from the main spillway. The low-level flow into the pipe is controlled by a 18-inch valve located on the upstream wall of the inlet. The valve is operated manually by a removable hand crank that fits into a small iron pipe attached to the face of the inlet.

The outlet end of the pipe discharges into the downstream channel approximately 80 feet from the inlet. The channel starts at the discharge outlet and continues downstream for a distance of 600 feet where it crosses under the Pocktown-Lambertville Road through a 14 foot x 8 foot opening.

A generalized description of the soil conditions is contained in Report No. 6, Hunterdon County, Engineering Soil Survey of New Jersey, by Rutgers University. The report dated 1952, indicates the area of the dam and pond to be stratified recent alluvium, with the surrounding area being diabase bedrock.

Recent alluvium can be described as materials usually assort by water action and ranging in size from silt with some clay, to silt and fine sand with gravel. Diabase is described as hard, non-homogeneous rock commonly identified as trap rock with variable overlaying depths of silts and silty clays with frequent gravelly phases. Geologic Overlay Sheet 27 classifies the underlaying rock as diabase.

b. Location

Schiller Pond Dam is located on a tributary of Alexauken Creek, in the Township of West Amwell, Hunterdon County, New Jersey. The dam is accessible from Route 179 at Mount Airy by way of Mill Road to Rocktown-Lambertville Road.

c. Size Classification

According to the "Recommended Guidelines for Safety Inspection of Dams" by the U.S. Department of the Army, Office of the Chief Engineers, the dam is classified in the dam size category as being "small", since its storage volume of 73 acre-feet is less than 1,000 acre-feet. The dam is also classified as "small" because its height of 18.5 feet is less than 40 feet. The overall size classification of Schiller Pond Dam is "small".

d. Hazard Classification

A hazard potential classification of "high" was assigned to Schiller Pond Dam on the basis that there are more than a dozen homes located on both sides of the stream downstream of the Rocktown-Lambertville Road. Therefore the possibility exists of the loss of more than a few lives in the event of a hypothetical failure of the dam.

e. Ownership

Schiller Pond Dam is owned by:

Mr. William Schiller
R.D.I., Box 350
Hopewell, NJ 08525
(609) 466-1687

f. Purpose

Schiller Pond Dam was originally constructed for irrigation but is presently used for recreational purposes only. The pond is stocked every year with trout by a fishing club.

g. Design and Construction History

Schiller Pond Dam was designed by the U.S. Soil Conservation Service. The permit to construct the dam was issued on September 3, 1959 with the dam being completed in November 1960.

h. Normal Operating Procedures

The discharge from the lake is unregulated and allowed to naturally balance the inflow into the lake. According to the owner the low-level outlet is not used due to the pond being heavily stocked with trout.

1.3 Pertinent Data

a. Drainage Area

1.37 sq. mi.

b. Discharge at Dam Site

Ungated spillway capacity at elevation of top of dam: 2,207 (311.50 NGVD)

Total spillway capacity at maximum pool elevation (SDF): 3,324 (312.3 NGVD)

c. Elevation (Feet above NGVD)

Top of dam: 311.5

Maximum pool design surcharge (SDF): 312.3

Recreation pool: 305

Spillway crest: Main: 305
Auxiliary: 307.5

Streambed at centerline of dam: 293 (Estimated)

Maximum tailwater: 296 (Estimated)

d. Reservoir

Length of maximum pool: 1,900 ft. (Estimated)

Length of recreation pool: 1,200 ft. (Estimated)

e. Storage (acre-feet)

Spillway Crest: 18

Top of dam: 73

Maximum pool (SDF): 83

f. Reservoir Surface (acres)

Top of dam: 11.5 (Estimated)

Maximum pool (SDF): 11.6 (Estimated)

Recreation pool: 5.5

Spillway crest: 5.5 (305 NGVD)

g. Dam

Type: Earthfill with concrete drop inlet

Length: 220 ft. (Effective)

Height: 18.5 ft.

Top width: 10 ft.

Side slopes - Upstream: 3H:1V
- Downstream: 4H:1V

Zoning: Unknown

Impervious core: None

Cutoff: 200 ft. clay cut-off

Grout curtain: None

h. Diversion and Regulating Tunnel

i. Spillway

Type: Main: Concrete drop inlet
Auxiliary: Earth Channel

Length of weir: Main: 28 ft.
Auxiliary: 60 ft.

Crest elevation: Main: 305 NGVD
Auxiliary: 307.5 NGVD

Gates:

U/S Channel: Main: Schiller Pond
D/S Channel: Auxiliary: Natural Channel

Main: Existing ground.

j. Regulating Outlets

Low level outlet: 72-inch C.M.P.

Controls: Manually controlled 18-inch valve.

Emergency gate: None

Outlet: 294. NGVD

SECTION 2

2. ENGINEERING DATA

2.1 Design

Drawings and specifications for the construction of the Schiller Pond Dam are available in the files of NJ Department of Environmental Protection (NJ-DEP) in Trenton and also at the offices of the U.S. Department of Agriculture - Soil Conservation Service (SCS) in Somerset N.J. The structural design data of the spillway as well as the hydrology and hydraulic data for 25-year and 50-year design storm is available at the above locations. One drawing shows the location of and data obtained from tests pits taken along the dam. Soil test results, design computations and other geotechnical data needed to assess the stability properly are not available.

2.2 Construction

Data is not available concerning the as-built construction of the dam. No data exists of construction methods, borrow sources or other data pertinent to the construction of the dam.

2.3 Operation

Formal operation records are not kept for the dam and reservoir. The pond is allowed to operate naturally without regulation.

2.4 Evaluation

a. Availability

The availability of engineering data is good. The construction plans and specifications for the dam are available from the NJ-DEP and the SCS.

b. Adequacy

The engineering data available from the plans and from the field was adequate to perform hydrologic and hydraulic computations. The data was insufficient to perform stability analysis, but a preliminary evaluation could be made based on visual observations.

c. Validity

The information contained in the drawings and checked by limited field measurements appears to be valid except downstream slope of the embankment measured 4H:1V instead of 2H:1V as shown on the plans.

SECTION 3

3. VISUAL INSPECTION

3.1 Findings

a. General

The visual inspection of Schiller Pond Dam revealed the dam and spillways to be in good condition. At the time of the inspection the pond level was just above the crest of the main spillway.

b. Dam

The earth embankment appears sound. No surface cracking on the embankment or at the toe was noticed. No sloughing or erosion of the embankment was observed. The vertical and horizontal alignments of the crest are good. A group of four evergreen trees are growing on the embankment at the junction with the left end of the auxiliary spillway. There is also one small tree growing at the water's edge left of the main spillway. No evidence of burrowing by animals was observed.

c. Appurtenant Structures

1. Spillways

The main spillway is a concrete drop inlet with an 18-inch valve. Wire fencing supported by iron pipes covers the top of the inlet to prevent the trout from going through the discharge pipe during high pond levels. The inlet is in good condition. The auxiliary spillway is grass covered and in good condition. Horizontal and vertical alignments of the auxiliary spillway are good.

2. Outlet Works

The low-level outlet works is also the main spillway. It consists of a drop inlet with a 18-inch valve attached to the front face of the inlet, and a 72-inch corrugated metal pipe that carries the flow to the downstream channel. The valve is operated by a removable hand crank. The outlet is in good condition. There is no headwall at the outlet end of the pipe. The riprap slope along the sides of the pipe is missing.

There is some minor slope erosion along the sides of the pipe, and immediatley downstream along the right bank.

d. Reservoir Area

The reservoir's side slopes are flat to moderate. There are some trees along the left shore line and a evergreen nursery on the back slope. Lakeside Road runs along the right shoreline. There is no indication of slope instability.

e. Downstream Channel

The downstream channel is in good condition. It is a well defined channel that starts at the outlet and then parallels Lakeside Road until it crosses under the Rocktown-Lambertville Road 600 feet downstream. The banks are wooded and shallow with the surrounding area relatively flat. Downstream of Rocktown-Lambertville Road there are houses on both sides of the stream.

S E C T I O N 4

4. OPERATIONAL PROCEDURES

4.1 Procedures

Schiller Pond Dam is used to impound water for recreational activities. The level of the lake is maintained through the unregulated flow over the spillway.

4.2 Maintenance of the Dam

There is no regular inspection and maintenance program for the dam and appurtenant structures. Mr. William Schiller is responsible for the maintenance of the dam.

4.3 Maintenance of Operating Facilities

The low-level outlet operating facilities consist of the one manually operated 18-inch valve. Operation of the valve was not satisfactorily demonstrated as the hand crank was not available.

4.4 Evaluation

The present operational and maintenance procedures are fair with the dam and spillway being maintained in a serviceable condition.

SECTION 5

5. HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design

The drainage area above Schiller Pond Dam is approximately 1.37 square miles. A drainage map of the water shed of the dam site is presented on Plate 1, Appendix D.

The topography within the basin is generally moderately sloped. Elevations range from approximately 473 feet above NGVD at the northwest end of the watershed to about 305 feet at the dam site. Land use patterns within the watershed are mostly woodland.

The evaluation of the hydraulic and hydrologic features of the dam was based on criteria set forth in the Corps guidelines and additional guidance provided by the Philadelphia District, Corps of Engineers. The SDF for the Dam falls in a range of 1/2 PMF to PMF. In this case, the low end of the range, 1/2 PMF, is chosen since the factors used to select size and hazard classification are on the low-side of their respective ranges.

The Probable Maximum Flood (PMF) was calculated from the probable maximum precipitation using Hydrometeorological Report No. 33 with standard reduction factors. Due to the small drainage area, the SCS triangular hydrograph transformed to a curvilinear hydrograph was adopted for developing the unit hydrograph, with the aid of the HEC-1-DB Flood Hydrograph Computer Program.

Initial and constant infiltration loss rates were applied to the Probable Maximum Precipitation to obtain rainfall excesses. The rainfall excesses were applied to the unit hydrograph to obtain the PMF and various ratios of PMF utilizing program HEC-1-DB.

The SDF peak outflow calculated for the dam is 3,324 cfs. This value is derived from the half PMF, and results in overtopping of the dam, assuming that the lake was originally at the spillway crest elevation.

The stage-outflow relation for the spillway was determined from the geometry of the spillway and dam utilizing HEC-1 Dam Safety Version program.

The reservoir stage-storage capacity relationship was computed directly by the conic method, utilizing the HEC-1-DB program. The reservoir surface areas at various elevations were measured by planimeter from a U.S.G.S. Quadrangle topographic map. Reservoir storage capacity included surcharge levels exceeding the top of the dam, and the spillway rating curve was based

on the assumption that the dam remains intact during routing. The spillway rating curve is presented in the Hydrologic Computation, Appendix D.

A breach analysis indicates that the stage of the stream where it crosses Rocktown - Lambertville Road is 0.6 feet higher, due to dam failure from overtopping at 0.4 PMF than it would be without failure at 0.4 PMF. This is likely not to jeopardize the well traveled road downstream significantly more than without failure. The discharge facility is thus rated "inadequate".

Drawdown calculations indicate that to empty the lake to an elevation of 299.5 NGVD through the one low-level outlet would take 20 hours, assuming a 2 cfs/square mile inflow. This is not considered to be an excessive drawdown period, and provision of additional outlets should not be considered.

b. Experience Data

No records of reservoir stage or spillway discharges are maintained for this site.

c. Visual Observation

The downstream channel is in good condition. It parallels Lakeside Road until the channel crosses under Rocktown-Lambertville Road 600 feet downstream of the dam. The banks are shallow and wooded. Downstream of Rocktown-Lambertville Road, there are houses on both sides of the stream.

The side slopes of the reservoir are flat to moderate with no signs of instability. The drainage area is primarily wooded and undeveloped.

d. Overtopping Potential

A storm of magnitude equivalent to the SDF would cause overtopping of the dam to a height of 0.8 feet. Computations indicate that the dam can pass approximately 35 percent of the PMF without overtopping the dam crest. Since the 1/2 PMF is the Spillway Design Flood (SDF) for this dam, according to the Recommended Guidelines for Safety Inspection of Dams by the Corps of Engineers, the spillway capacity of the dam is assessed as "inadequate".

SECTION 6

6. STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

There are no signs of distress in the embankment of the Schiller Pond Dam. The trees growing on the embankment at the junction with the auxiliary spillway could pose a threat to stability. The spillways are in good condition.

b. Design and Construction Data

No design computations relating to stability were uncovered during the report preparation phase. No embankment or foundation soil parameters are available for carrying out a conventional stability analysis of the embankment.

c. Operating Records

No operating records are available relating to the stability of the dam.

d. Post-Construction Changes

There are no known post-construction changes since the dam was built in 1960.

e. Static Stability

A static stability analysis was not performed for Schiller Pond Dam because the lack of data on which to base assumptions of material properties within embankment zones might produce misleading results, but based on the findings of the visual inspection, the preliminary assessment of static stability is that it is satisfactory.

f. Seismic Stability

The dam is located in Seismic Zone 1, as defined in Recommended Guidelines for Safety Inspection of Dams, prepared by the Corps of Engineers. In general, projects located in Seismic Zones 0, 1 and 2 may be assumed to present no hazard from earthquake, provided the static stability conditions are satisfactory and conventional safety margins exist, and based on the findings of the visual inspection, the preliminary assessment of the static and seismic stabilities is that they are satisfactory.

SECTION 7

7. ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment

a. Safety

The dam has been inspected visually and a review has been made of the available engineering data. This assessment is subject to the limitations inherent in the visual inspection procedures stipulated by the Corps of Engineers for a Phase 1 report.

Schiller Pond Dam is inadequate because the dam does not have the spillway capacity to pass the SDF, one half of the PMF, without overtopping. Overtopping of the dam carries with it the danger of a likely progressive failure of the dam. The present spillway capacity of the dam is approximately 35 percent of the PMF.

No definitive statement pertaining to the safety of the embankment can be made without acquisition of embankment material engineering properties, but based on the findings of the visual inspection, preliminary assessment of the static stability is that it is satisfactory.

b. Adequacy of Information

The information uncovered was adequate to perform hydrologic and hydraulic computations. The data was insufficient to perform even an approximate computation of the stability of the dam. A preliminary assessment of the dam could be made by visual observation only.

c. Urgency

The remedial measures and recommended actions along with a timetable for their completion are detailed below. All recommended action should be conducted under the supervision of an engineer who is experienced in the design, construction and inspection of dams.

7.2 Remedial Measures

a. Alternatives for Increasing Spillway Capacity

Alternatives for increasing spillway capacity are as follows:

1. Increase the embankment height of the dam thus permitting a higher discharge to pass.

2. Lower the spillway crest elevation.
3. Increase the effective spillway crest length.
4. A combination of any of the above alternatives.

b. Recommendations

1. Carry out a more precise hydrologic and hydraulic analysis of the dam within twelve months, to determine the need and type of mitigating measures necessary. If required, conduct a study of the means of increasing spillway discharge capacity and develop alternative schemes for construction. This should include the installation of headwater and tailwater gages. The ability of the dam to withstand overtopping should also be studied.
2. Construct a concrete headwall and apron at the outlet end of the discharge pipe within twelve months.
3. Remove the trees from the embankment slopes to avoid problems from roots. The area should then be seeded to develop a growth of grass for surface erosion protection. This should be done within twelve months.
4. Determine if the low-level outlet is operable, and if not institute remedial action to make it operable within twelve months.

The following additional action is recommended:

The owner should develop an emergency action plan (if one is not already available) outlining actions to be taken by the operator to minimize downstream effects of an emergency and establish a flood warning system for the downstream communities within three months.

c. O & M Procedures

The owner should develop, within one (1) year after formal approval of the report, written operating procedures and a periodic maintenance plan to insure the safety of the dam.

PLATES .

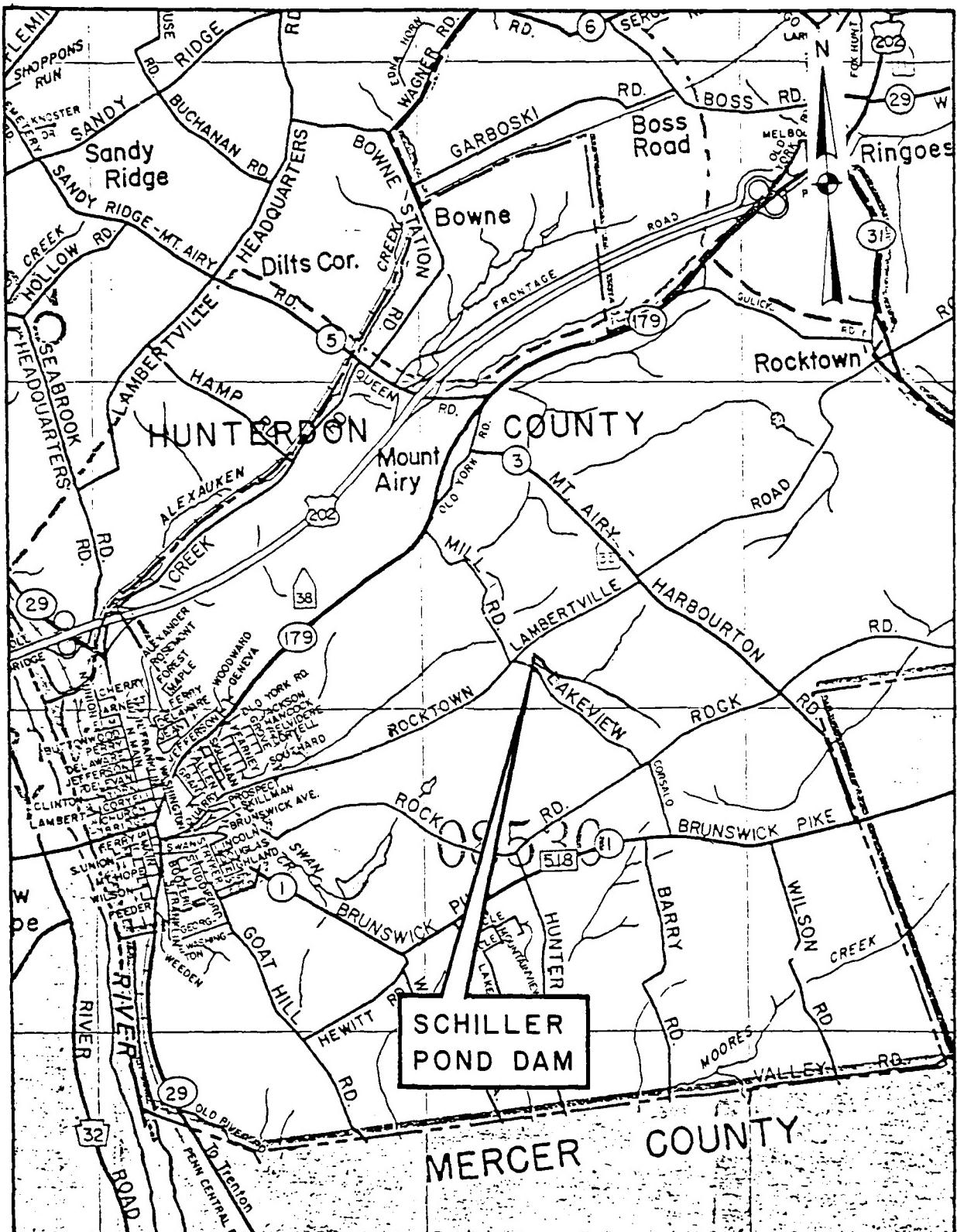
SCHILLER POND DAM

WEST AMWELL TWP.
HUNTERDON CO., N. J.



KEY MAP

PLATE I

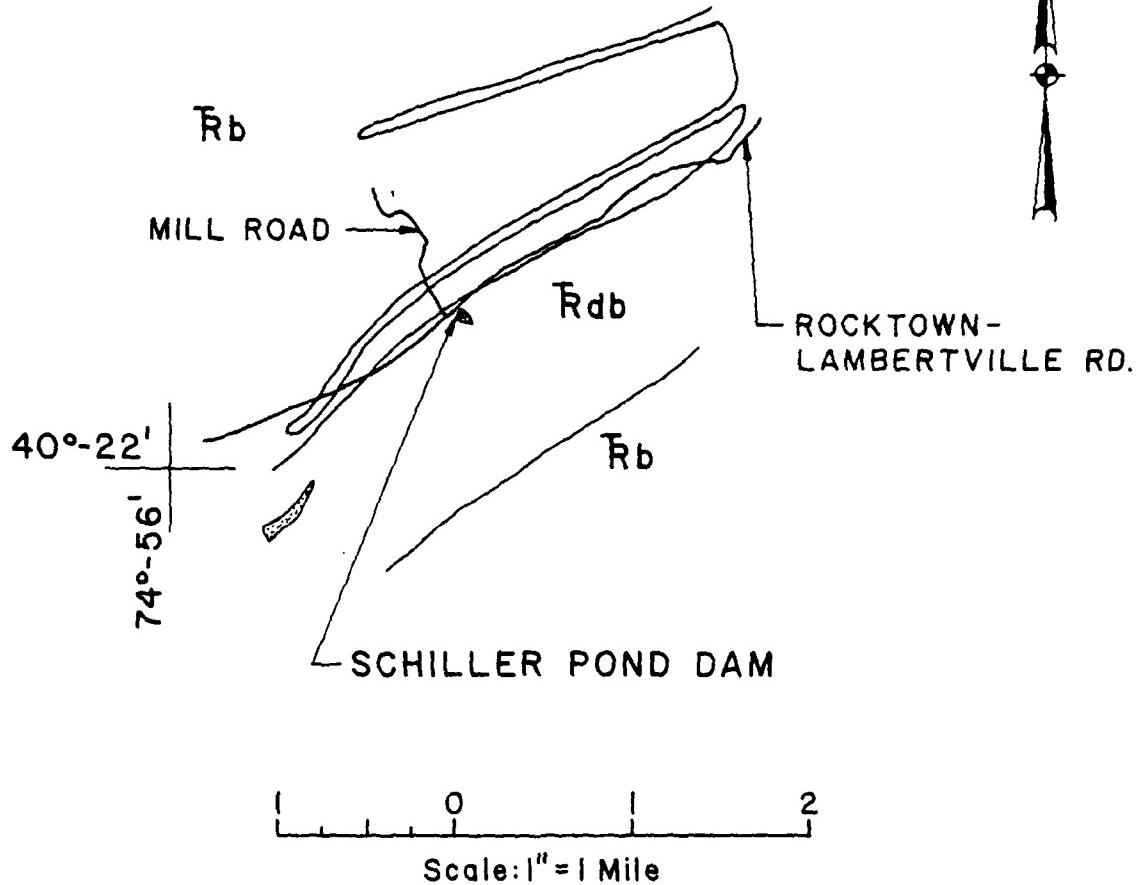


Scale in Miles (Approx.)



VICINITY MAP

PLATE 2



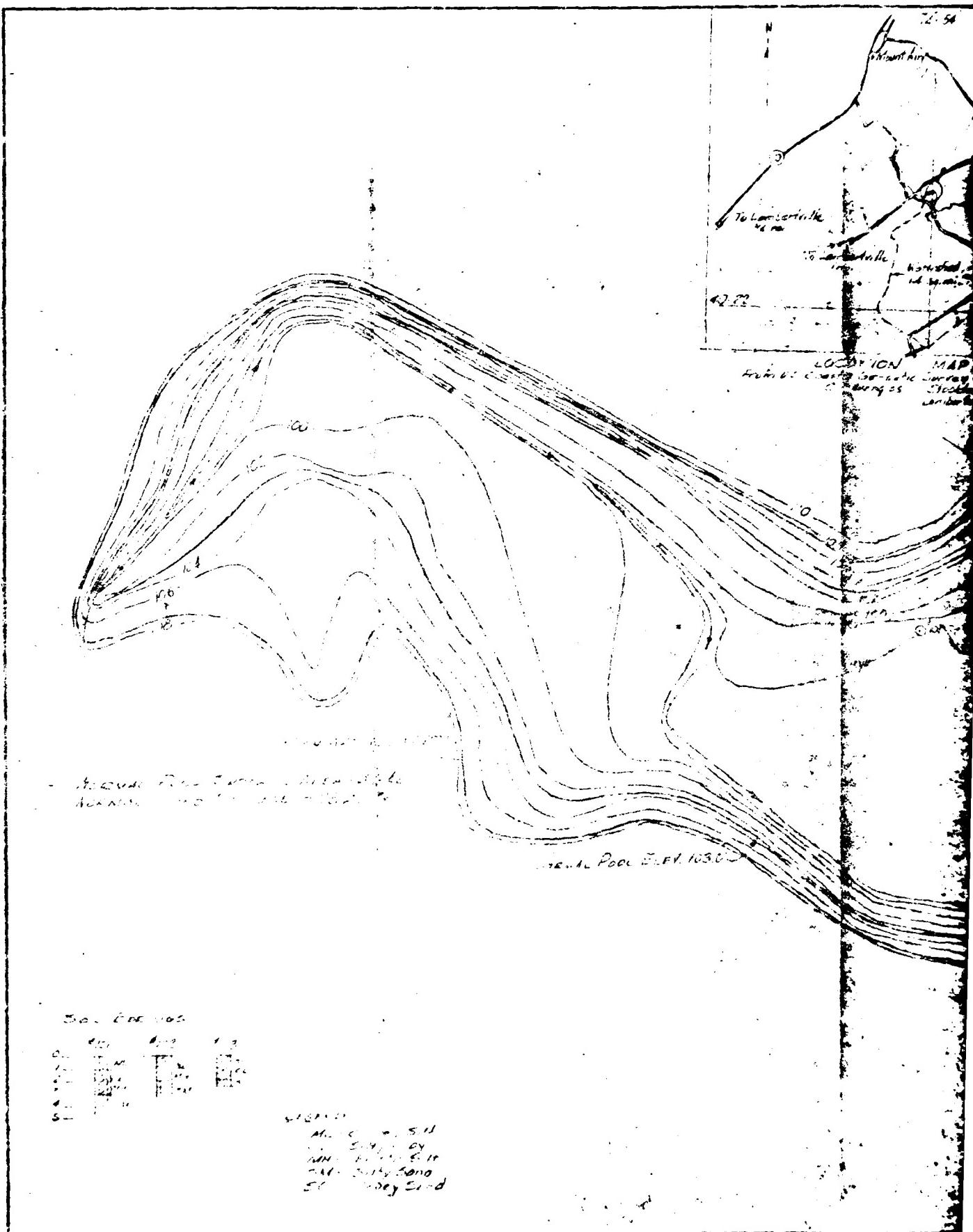
LEGEND

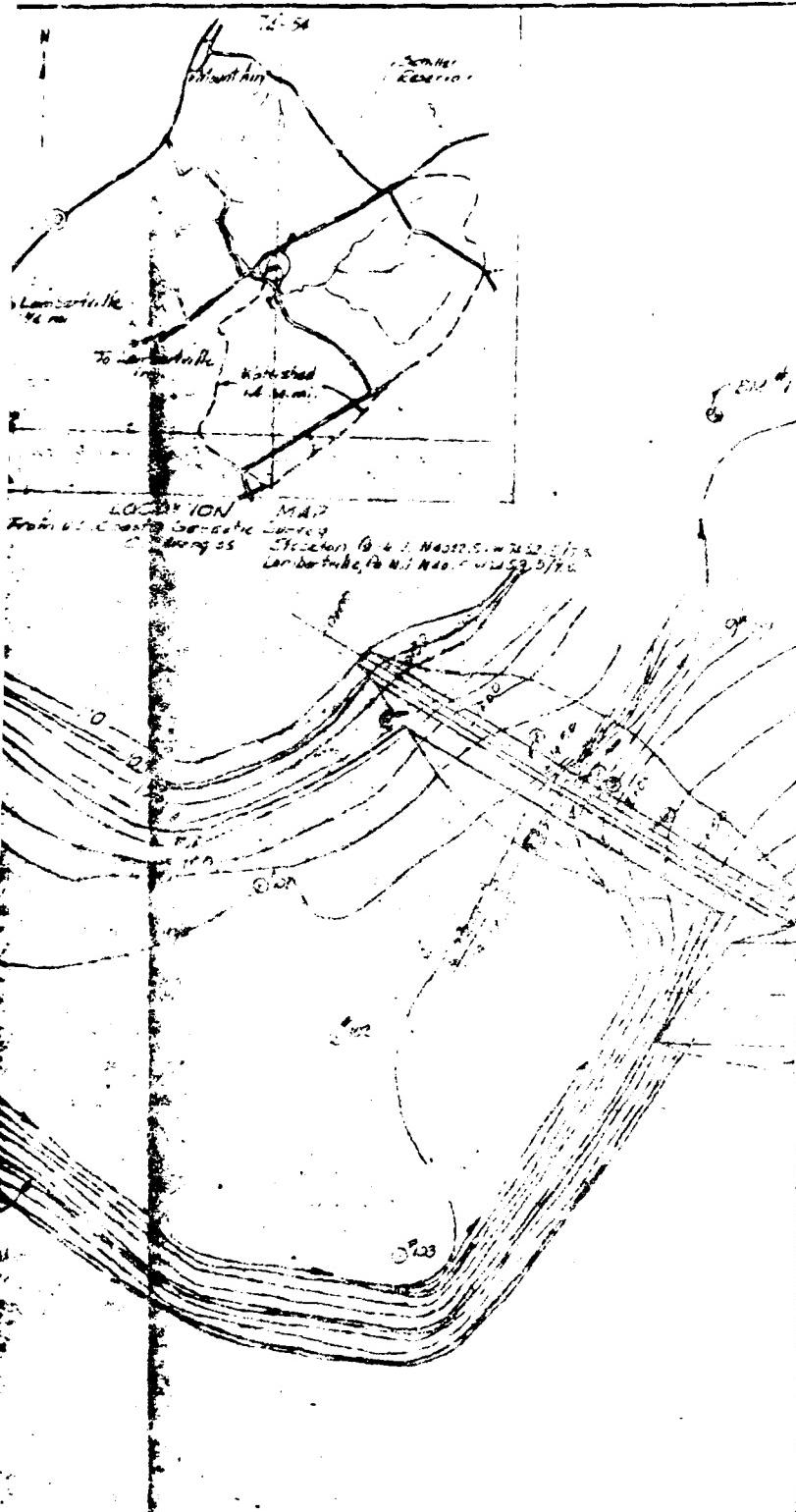
TRIASSIC

R_b Brunswick Formation

R_{db} Diabase

GEOLOGIC MAP
SCHILLER POND DAM





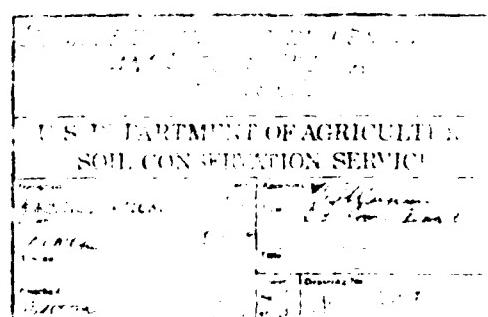
1905 a cerca de 17 horas
descubrieron en el cerro de la
Cerro del Cerro una gran cantidad
de un material de color.

**PARADES AND CEREMONIES
IN THE UNITED STATES
AND CANADA**

CCP 3-183

DEM APPLICATION No. 332

DAM APPLICATION N-532



1000-441 ELE. 415

2000-441 ELE. 415

1000-441 ELE. 415

2000-441 ELE. 415

PROFLE ALONG E 415

1000-441 ELE. 415

SECTION IN E 415

1200 - Site Location
N - Crops, Soil
CL - Soil Layer
LS - Crops, Soil
LSM - Soil Layer
LMS - Layer
C - Cropland, Water
C - Crop, Water
C - Crop, Water

FILE

SOIL CONSERVATION SERVICE
AND RELATED AGRICULTURAL
INVESTIGATIONS

PP 305

Approved
B. H. Johnson
DAM APPLICATION No. 632

DAM APPLICATION NO. 632

FILE
Concrete dam
with 16 waterways
and 21,000 cubic
yards concrete
constructed to replace
existing stream diversion

SCHILLER FARMATION & DEVELOPMENT
PLATE 5 OF 5 PLATES
HORNADYON, CO., U.S.A.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Location & Name	57	Approved by
Date	6-1960	Signature
Soil Conservation Service	2	Date

1/2" from edge
do not
ALWAYS SEE
NOT

DO NOT
SEE

in face

Sec

ALWAYS SEE

12' on chord
1/2 from edge or upper horizontal program
dia 1", on e 10 on lower dia

ANTI SEE COLLAR (12043)
LOT TO DATE

Design A

NOTE
1/2 Chord dia 0.250 - 1/2" thick on main frame
Mole on bottom 18"

WAN 12043	LEMID	AMOUNT
4'8"		200.00
4'6"		26.24
4'6"		216.00
4'7"	57	284.76
3'10"		17.60
9'7"	18	11.15
		9.67
		200.00
		500.26
		104.00
		313.30
		.00

140 TIPS

100

100

After

DAM APPLICATION NO. 6301

FILE

DAM APPLICATION NO. 6301

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

APPENDIX A
CHECK LIST - VISUAL OBSERVATIONS
CHECK LIST - ENGINEERING, CONSTRUCTION
MAINTENANCE DATA

CHECK LIST
VISUAL INSPECTION
PLEASE 1

Name Dam Schiller Pond Dam County Hunterdon State New Jersey Coordinators NJ-DEP

Date(s) Inspection January 13, 1981 Weather Clear Temperature 0° F
February 3, 1981 Clear 10° F

Pool Elevation at Time of Inspection 305 NGVD Tailwater at Time of Inspection 294.5 NGVD

Inspection Personnel:
January 13, 1981

William Birch
Thomas Moroney
Joseph Sirianni (Recorder)

OWNER/REPRESENTATIVE:

January 13, 1981
William Schiller
R.D.I., Box 350
Hopewell, NJ 08525

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS AND RECOMMENDATIONS
SURFACE CRACKS		
	None noticed.	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE		
	None noticed.	
SLoughing or erosion of embankment and abutment slopes		
	Some minor erosion on the downstream slope by the outlet pipe.	
VERTICAL & HORIZONTAL ALIGNMENT OF THE CREST		
	Horizontal and vertical alignments appear good.	
RIPRAP FAILURES		
	None	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS AND RECOMMENDATIONS
EARTH EMBANKMENT	Embankment is grass covered and in good condition. A small clump of evergreen trees growing at the junction of the embankment with the left end of the auxiliary spillway. One small tree growing at edge of the pond left of drop inlet.	Remove trees.
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Junction of the embankment with the auxiliary spillway is in good condition.	
ANY NOTICEABLE SEEPAGE	None noticed.	
STAFF GAGE AND RECORDER	None.	
DRAINS	None.	

OUTLET WORKS	OUTLET WORKS	REMARKS AND RECOMMENDATIONS
VISUAL EXAMINATION OF	OBSERVATIONS	
CRACKING & SPALLING OF CONCRETE SURFACES IN STILLING BASIN	N/A - Main spillway (also outlet works) discharges directly into the downstream channel. Auxiliary spillway discharges onto existing ground and then into the downstream channel.	Provide concrete headwall and apron. Determine if low-level outlet gate is operable.
INTAKE STRUCTURE	Main spillway is concrete drop inlet with a valve and is in good condition. N/A - Auxiliary spillway.	
OUTLET STRUCTURE	A 72-inch corrugated metal pipe in good condition. There is no headwall at outlet end of pipe. Riprap of slope along sides of pipe is missing. There is minor erosion of slope on sides of pipe. Valve was not opened as hand crank was missing. Owner stated valve not used due to pond being stocked with trout.	
OUTLET FACILITIES	None.	
EMERGENCY GATE	None	

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS AND RECOMMENDATIONS</u>
UNGATED SPILLWAY		
CONCRETE WEIR	Main spillway is a concrete drop inlet with a valve. The spillway is in good condition. Auxiliary spillway is a grass channel.	
APPROACH CHANNEL	The pond is the approach channel for both spillways.	
DISCHARGE CHANNEL	Main spillway: 72-inch corrugated metal pipe, in good condition, is the discharge channel and low-level outlet. Auxiliary spillway: Grass covered channel in good condition.	
BRIDGE AND PIERS	N/A	

INSTRUMENTATION

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS AND RECOMMENDATIONS</u>
<u>MONUMENTATION/SURVEYS</u>		
None.		
<u>OBSERVATION WELLS</u>		
None.		
<u>WEIRS</u>		
None.		
<u>PIEZOMETERS</u>		
None.		
<u>OTHER</u>		
None.		

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS AND RECOMMENDATIONS
SLOPES	The slopes are flat to moderate. There are some trees growing along the left shore and a evergreen nursery on the back slope. There is no indication of slope instability.	
SEDIMENTATION	None observed. Pond covered with ice.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	OBSERVATIONS	REMARKS AND RECOMMENDATIONS
	Channel in good condition well define with no debris.	
SLOPES	Slopes of channel are about 2-feet high, steep and wooded. Surrounding area of channel is flat. Minor erosion of right bank just downstream of the outlet pipe.	
APPROXIMATE NUMBER OF HOMES AND POPULATION	There are more than a dozen houses both sides of the downstream channel after it crosses under Rocktown-Lambertville Road approximately 600 feet downstream of the dam.	

CHECK LIST
 ENGINEERING DATA
 DESIGN, CONSTRUCTION, OPERATION

ITEM	REMARKS
PLAN OF DAM	Available on microfilm at NJ Department of Environmental Protection (NJ-DEP), 1474 Prospect Street, P.O. Box CN-029, Trenton, NJ 08625 Available at U.S. Department of Agriculture Soil Conservation Service (SCS) 1370 Hamilton Street, Somerset, NJ 08873
REGIONAL VICINITY MAP	Available. Hunterdon County Map and U.S.G.S. Quadrangle sheet for Stockton, N.J.
CONSTRUCTION HISTORY	No formal history exists, but can be deduced from available microfilm at NJ-DEP.
TYPICAL SECTIONS OF DAM	Available on microfilm at NJ-DEP and SCS files.
HYDROLOGIC/HYDRAULIC DATA	Limited data available at NJ-DEP and SCS files.
OUTLETS - PLAN	Available on microfilm, NJ-DEP and SCS files.
- DETAILS	Available on microfilm, NJ-DEP and SCS files.
- CONSTRAINTS	None.
- DISCHARGE RATINGS	Not available.
RAINFALL / RESERVOIR RECORDS	Not available.

CHECK LIST
 ENGINEERING DATA
 DESIGN, CONSTRUCTION, OPERATION
 (continued)

ITEM	REMARKS
GEOLOGY REPORTS	Available U.S.G.S. Geologic Overlay Sheet for Hunterdon County and Engineering Soils Survey of New Jersey, Report No. 6 - Hunterdon County, by Rutgers University (New Brunswick, NJ).
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	Limited data available on microfilm, NJ-DEP and SCS files. None available.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	Test pit results available on microfilm, NJ-DEP and SCS files. None available.
POST-CONSTRUCTION SURVEYS OF DAM	None.
BORROW SOURCES	Unknown.
STILLWAY PLAN - SECTIONS - DETAILS	Available on microfilm, NJ-DEP and SCS files.

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
(continued)

11

REMARKS

ITEM	REMARKS
OPERATING EQUIPMENT PLANS AND DETAILS	None available.
MONITORING SYSTEMS	None available.
EDUCATIONS	None
HIGH POOL RECORDS	Not kept.
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None
PRIOR ACCIDENTS OF FAILURE OF BM - DESCRIPTION - REPORTS	None known to exist.
MAINTENANCE OPERATION RECORDS	None known to exist.

APPENDIX B

PHOTOGRAPHS

SCHILLER POND DAM



Photo 1 - View of dam taken from right bank of auxiliary spillway. Note clump of trees on embankment in right of photo. (Photo taken on January 13, 1961.)

SCHILLER POND DAM



Photo 2 - View of discharge channel of auxiliary spillway.
(Photo taken on January 13, 1981.)



Photo 3 - View of downstream slope looking towards left end of dam. Note low-level outlet pipe in the lower right. (Photo taken on February 3, 1981.)

SCHILLER POND DAM



Photo 4 - View of upstream slope of dam looking towards the right end. (Photo taken on January 13, 1981.)

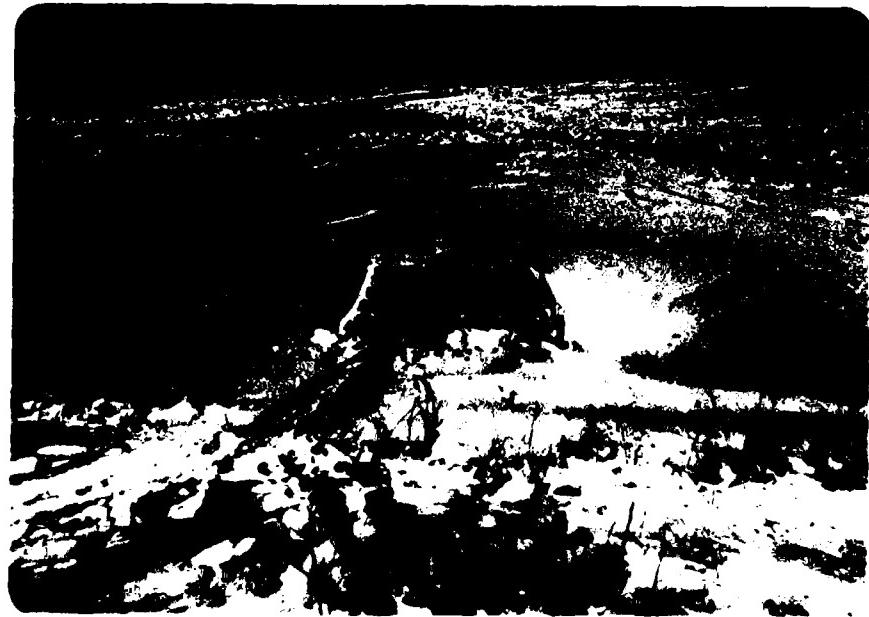


Photo 5 - View of drop inlet (main spillway) and pond from the top of the embankment. (Photo taken on January 13, 1981.)

SCHILLER POND DAM



Photo 6 - View of downstream channel and outlet pipe from top of the embankment. (Photo taken on January 13, 1981.)



Photo 7 - View of 72-inch C.M.P. outlet pipe. Note minor erosion on sides of pipe. (Photo taken on February 3, 1981.)

SCHILLER POND DAM



Photo 8 - View of downstream channel crossing under Rocktown-Lambertville Road. (Photo taken on January 13, 1981.)



Photo 9 - View of channel and houses downstream from Rocktown-Lambertville Road. (Photo taken on January 13, 1981.)

APPENDIX C

SUMMARY OF ENGINEERING DATA

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

Name of Dam: SCHILLER POND DAM

Drainage Area Characteristics: 1.4 square miles

Elevation Top Normal Pool (Storage Capacity): 305 NGVD (18 acre-feet)

Elevation Top Flood Control Pool (Storage Capacity): N/A

Elevation Maximum Design Pool: 312.3 NGVD (SDF pool-83 acre-feet)

Elevation Top Dam: 311.5 NGVD (73 acre-feet)

SPILLWAY CREST: Main: 305 NGVD

a. Elevation Auxiliary: 307.5 NGVD

b. Type Main: Concrete drop inlet
Auxiliary: Natural channel

c. Width Main: 10 feet

Auxiliary: 20 feet

d. Length Main: 28 feet

Auxiliary: 60 feet

e. Location Spillover Entire length

f. No. and Type of Gates None

OUTLET WORKS:

a. Type 72-inch C.M.P.

b. Location Upstream face of spillway

c. Entrance Inverts 294.5 NGVD

d. Exit Inverts 294.0 NGVD

e. Emergency Draindown Facilities 18-inch valve 72-inch C.M.P.

HYDROMETEOROLOGICAL GAGES:

a. Type None

b. Location None

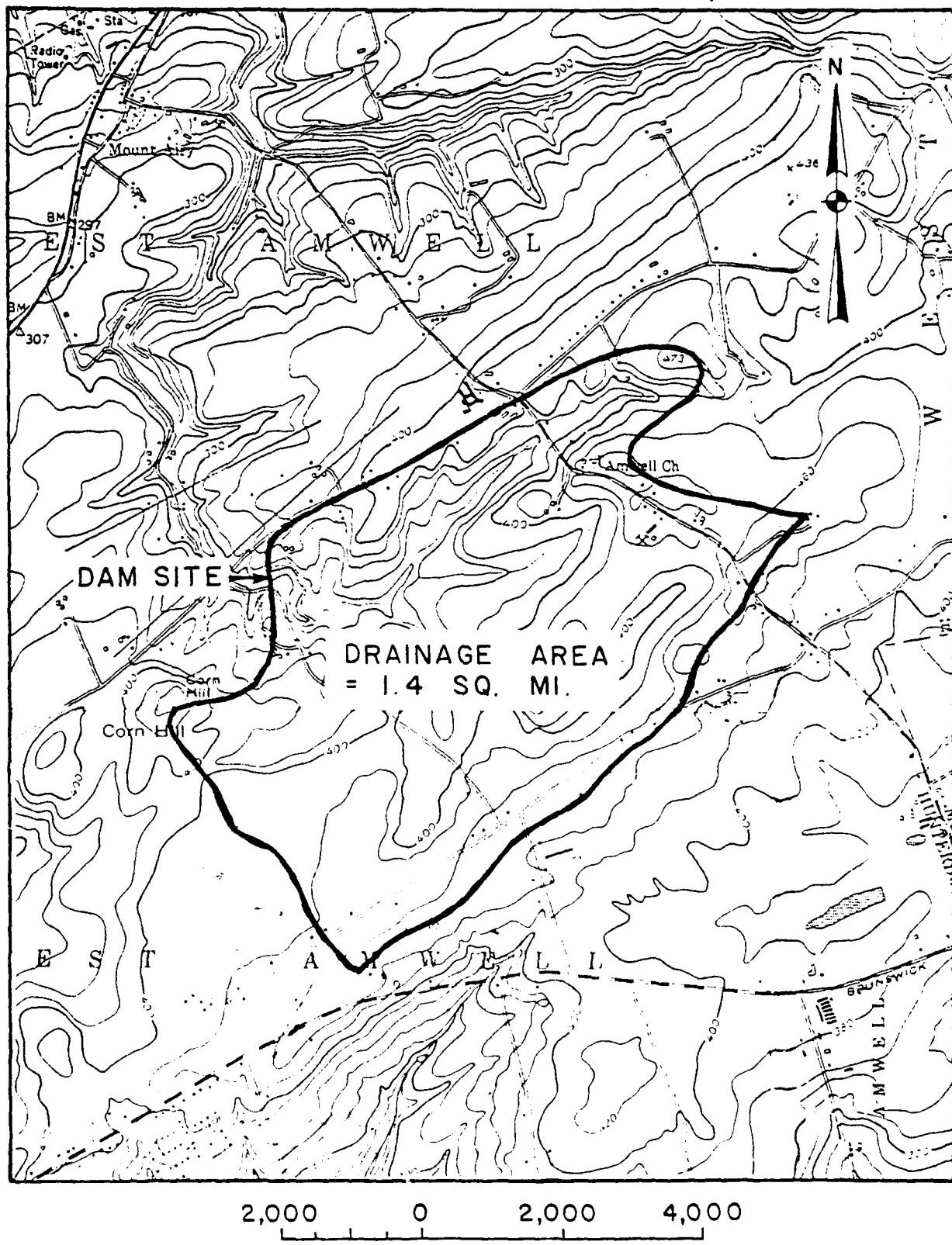
c. Records None

MAXIMUM NON-DAMAGING DISCHARGE: 2,207 cfs at elevation 311.5 NGVD

APPENDIX D

HYDROLOGIC COMPUTATIONS

PLATE I, APPENDIX D



2,000 0 2,000 4,000

Scale: 1" = 2,000 FT.

SCHILLER POND DAM
DRAINAGE BASIN

PRC Harris, Inc.
CONSULTING ENGINEERS

SUBJECT N. J. Dam Inspection
Schiller Pond Dam
COMPUTED BY S.B. CHECKED BY

SHEET NO. 1 OF
JOB NO. 10-1176-01
DATE Feb, 1981

Area of the Lake at normal top level :

(Area measured from U.S.G.S quad
at El = 305.0 = 5.5 Ac.

Height of the Dam = 18.5 FT
(From File)

Small Dam, High Hazard

$$S.D.F = \frac{1}{2} PNF$$

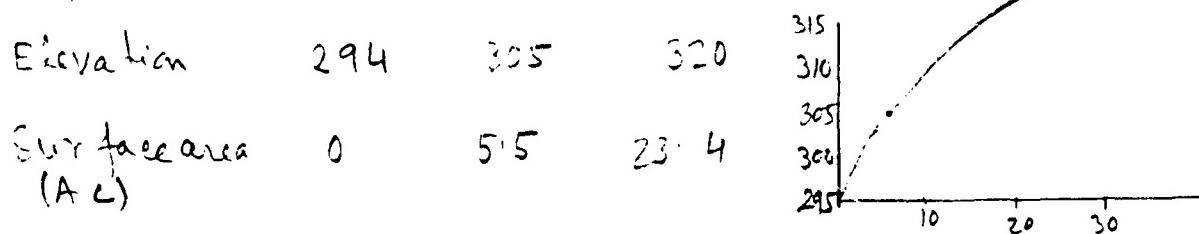
Hydrologic analysis:-

$$D.A = 1.37 \text{ sq. miles}$$

Inflow Hydrograph at Reservoir was determined
using HEC-1 DB program. Inflow routed
through the reservoir

Elevation Area Capacity Relationship

Information obtained from U.S.G.S



HEC-1 DB program will calculate

Storage capacity from surface area = at elevation.

PRC Harris, Inc.
CONSULTING ENGINEERS

SUBJECT: N.J. Dam Inspection
Schiller Pond Dam
COMPUTED BY: S.B. CHECKED BY:

SHET NO. 2 OF
JOB NO. 10-1176-01
DATE 1/7/60

Determination of PMP

Probable Maximum Ppt. (inches) for an area of
10 square miles and 6 hour duration
= 26"

$$D.A = 1.37 \text{ sq miles}$$

$$\text{ZONE} = 6$$

The corps of Engineers recommended that
20% reduction be applied to the
report value for a 10 sq miles drainage
area in order to provide for the imperfect
fit of the storm isohyetal patterns to the
shape of the particular basin.

Because of the unlikelihood of a perfect
strike of a storm center on any particular
small basin, no variation is assumed between
point and 10 square miles precipitation

$$P.M.P = 26" \times (1 - 0.2) = 20.8" \text{ (This adjustment is made by the computer)}$$

Depth area duration relationship:

Percentage to be applied to the above 6 hr PMP

$$6 \text{ hr} = 100 \%$$

$$12 \text{ hr} = 108 \%$$

$$24 \text{ hr} = 117 \%$$

$$48 \text{ hr} = 127 \% \text{ (Not necessary)}$$

Infiltration: Initial = 1.0 inch

Const. Infiltration = 0.1 inch/hr

PRC Harris, Inc.
CONSULTING ENGINEERS

SUBJECT: N.I. Ivin Inspection
Schiller Pond Dam
COMPUTED BY: S.B. CHECKED BY:

SHEET NO. 3 or
JOB NO. 10-1176-C1
DATE Feb., 1971

DETERMINATION OF Tc

1. Estimating T_c from velocity estimate and Watershed length (Ref. Design of Small Dam : Fig 30)

	Slope	Vel	Remarks
Overland Flow	$\frac{473 - 360}{2400} = 4.7\text{ ft/sec}$	3.4 ft/sec	Under berm/bank as watershed
Reach 1	$\frac{360 - 305}{2950} = 1.9\text{ ft/sec}$	1.5 ft/sec	Natural channel not well developed (Lake excluded)
T_c	$= \frac{2400}{3 \times 3600} + \frac{2950}{1 \times 3600} = 1.04 \text{ hrs.}$		

2. Estimating T_c assuming same vel of 1.5 ft/sec

$$T_c = \frac{5350}{1.5 \times 3600} = 0.99 \text{ hrs}$$

3. From Nomograph of design of Small Dam (S.C.S. Guide) — Same as Kirpich

$$T_c = \left(\frac{11.9 L^3}{H} \right)^{.385}$$

L in miles = 1.01 miles
(Lake excluded)

$$= \left(\frac{11.9 \times 1.01^3}{168} \right)^{.385}$$

$H = 168 \text{ Ft.}$

$$= 1.36 \text{ Hrs.}$$

Use $T_c = 1 \text{ hrs.}$

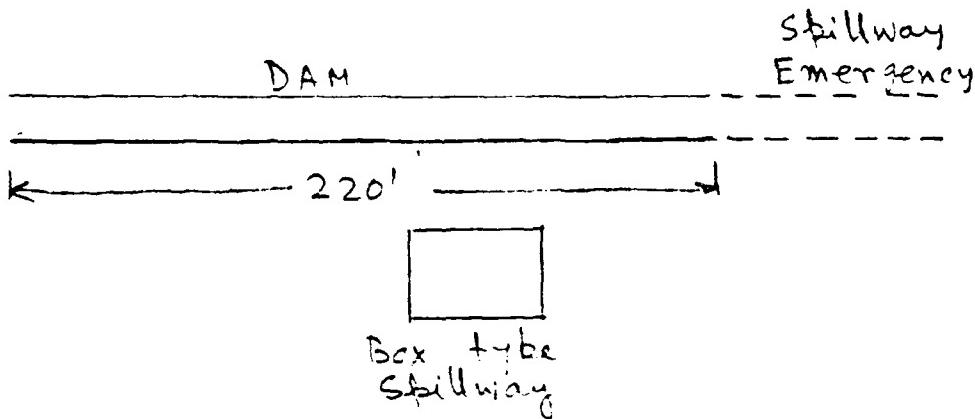
$$\text{Lag} = 1.6 T_c = 1.6 \times 1 = 0.6 \text{ hrs.}$$

PRC Harris, Inc.
CONSULTING ENGINEERS

SUBJECT N.J. Dam Inspection
Schiller Pond Dam
COMPUTED BY S.B. CHECKED BY

4
SHEET NO. OF
JOB NO. 10-1176-01
DATE Feb, 1981

DAM & SPILLWAY



Water entering through all four sides of the spillway.

- ✓ Total length of spillway main = 28'
- ✓ Elevation = 305.0 FT MSL

Elevation shown in S.C.S drawing are added with 202 ft to get the actual elevation comparable to U.S.G.S.

- ✓ Total effective length of emergency spillway = 60'
- ✓ Elevation of Aux. Spillway = 307.4 FT MSL
- ~ Length of Dam = 220'
- ~ Ave. El of Dam : 311.5 FT MSL

Outlet 6' diameter pipe

Drop inlet spillway :-

$$\text{Eff. length} = 28'$$

$$Q_s = C_s L_s H_s^{1.5} = 3.3 \times 28 H_s^{1.5} = 92.4 H_s^{1.5}$$

Considering flow through the tube (6' dia)

$$\begin{aligned} Q_o &= C_d \cdot A_o \cdot \sqrt{2g} H_o \\ &= 1.63 / \left(\frac{\pi}{4} \times (6^2) \right) \times 8 \sqrt{H_o} \\ &= 143 \sqrt{H_o} \end{aligned}$$

Where H_o = Difference of elevation between
N.W. and T.W.

Tailwater assumed to be = 296 Ft MSL

Invert of the tube 294 Ft MSL

Res. El	Head over Spillway HS	& through Spillway $92.4 H_s^{1.5}$	Head for critice flow H_o	Flow thro' critice $Q_c = 143\sqrt{H_o}$	
305	-	0	-	-	
306	1	92.4	10	452	
307.4	2.4	343	11.4	482	
309	4	739	13	515	
311.5	6.5		15.5	563	
313	8		17	590	
315	10		19	623	
317	12		21	655	
319	14		23	686	
321	16		25	715	
325	20		29	770	

Flow controlled by tube.

Stage Outflow relationship :-

① Flow through Drop inlet Q_D (Skillway)

③ Flow through Emergency Spillway

$$Q_A = 3.3 L_A H_A^{1.5}$$

$$= 3.3 \times 60 H_A^{1.5} = 198 H_A^{1.5}$$

③ Flow through Dam

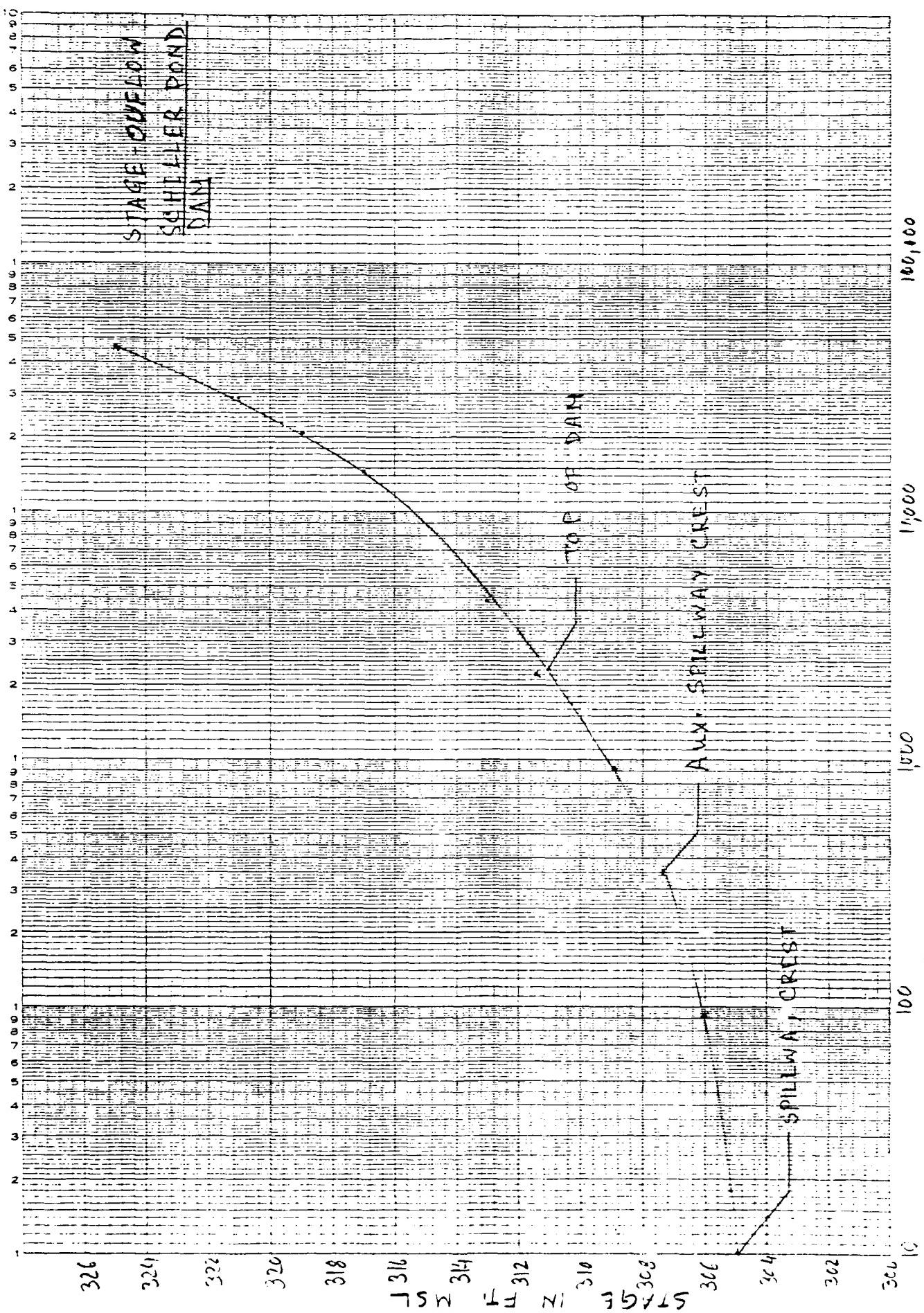
$$Q_D = 2.75 L_D H_D^{1.5}$$

$$= 2.75 \times 220 H_D^{1.5} = 605 H_D^{1.5}$$

Stage in Reservoir	Spillway L_A	Emergency Spillway		DAM		Total
		H_A	Q_A	H_D	Q_D	
305	0					0
306	92					92
307.4	343	0	0			343
309	515	1.6	400			915
311.5	563	4.1	1,644	0	0	2,207
313	590	5.6	2,624	1.5	1,111	4,325
315	623	7.6	4,149	3.5	3,961	6,733
317	655	9.6	5,289	5.5	7,804	14,348
319	686	11.6	7,823	7.5	12,426	22,935
321	715	13.6	9,931	9.5	17,715	26,361
325	770	17.6	14,620	13.5	38,009	45,399

ESTATE PLANNING FOR
PARENTS OF A CHILD WITH A

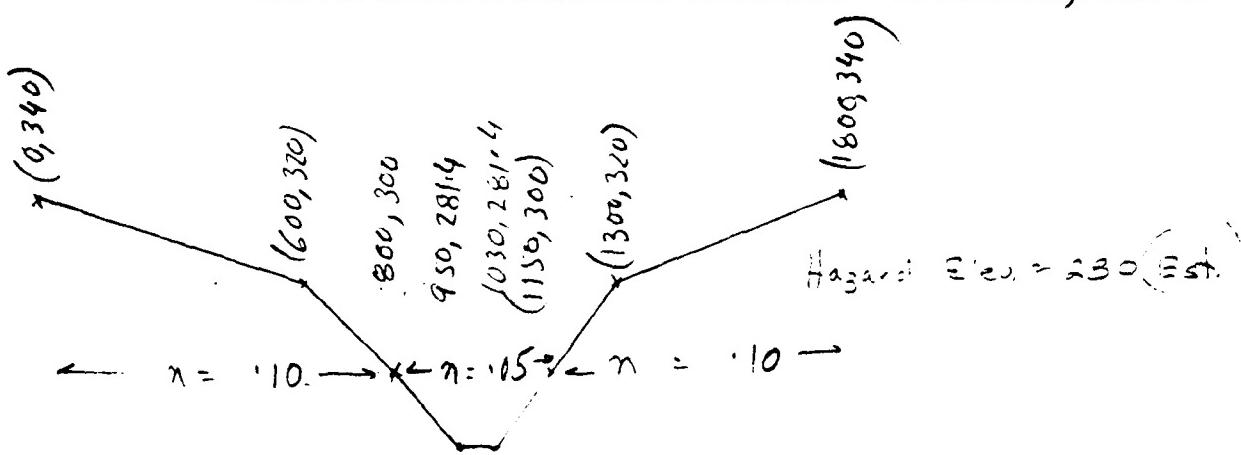
NO. 3419-L510 DIETZGEN GRAPH PAPER
5 CYCLES X 10 DIVISIONS PER INCH



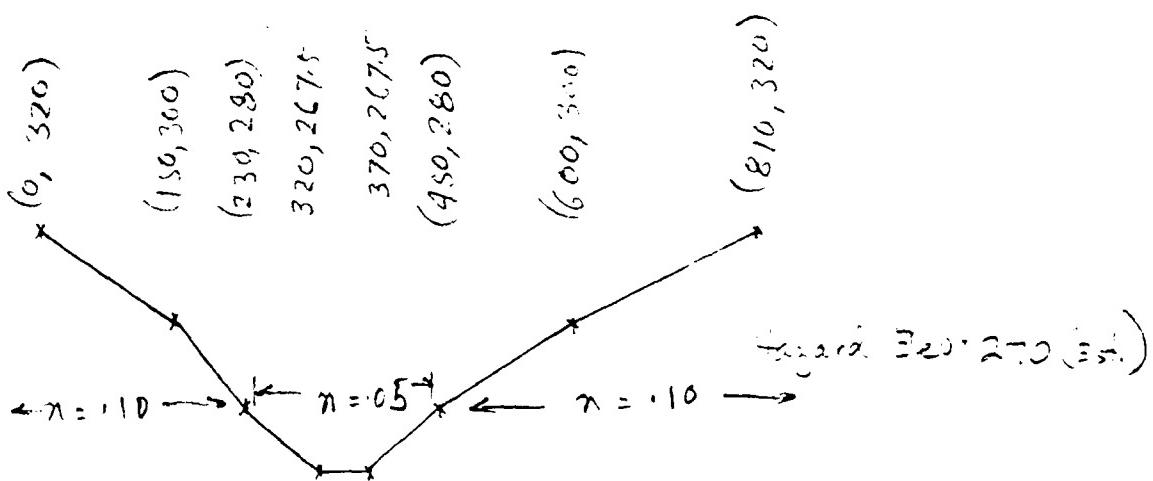
PRC Harris, Inc.
CONSULTING ENGINEERS

SUBJECT N.J. Dam Inspection
Schiller Pond Dam
COMPUTED BY S.B. CHECKED BY

SHEET NO. 8 OF
 JOB NO. 10-1176-51
 DATE. Feb., 1921.



Reach 1 : $L = 800 \text{ ft}$
 $s = .0095$



Reach 2 : $L = 2,000 \text{ ft}$ Length of Reach
 $s = .0125$ = 1,200

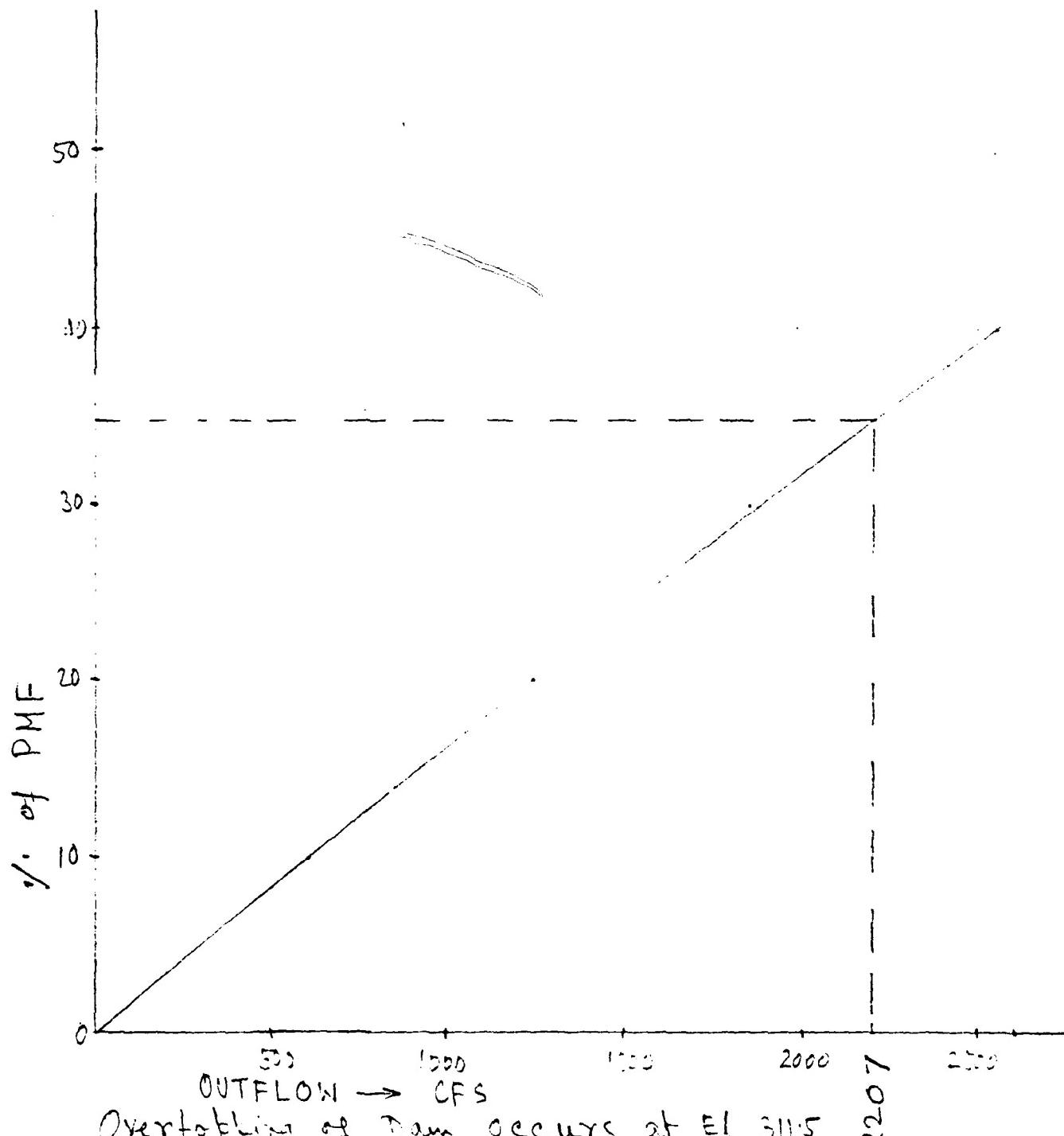
CROSS SECTION AT D/S REACH

PRC Harris, Inc.
CONSULTING ENGINEERS

SUBJECT N.J. Dam Inspection
Schiller Pond Dam
COMPUTED BY S.D. CHECKED BY

SHEET NO. 9 OF
 JOB NO. 10-1176-C1
 DATE Feb., 1981

Overtopping Potential



OUTFLOW → CFS
Overtopping of Dam occurs at El 311.5

$$\& = 2207 \text{ (} 35 \text{ + } \text{? DHF})$$

PRC Harris, Inc.
CONSULTING ENGINEERS

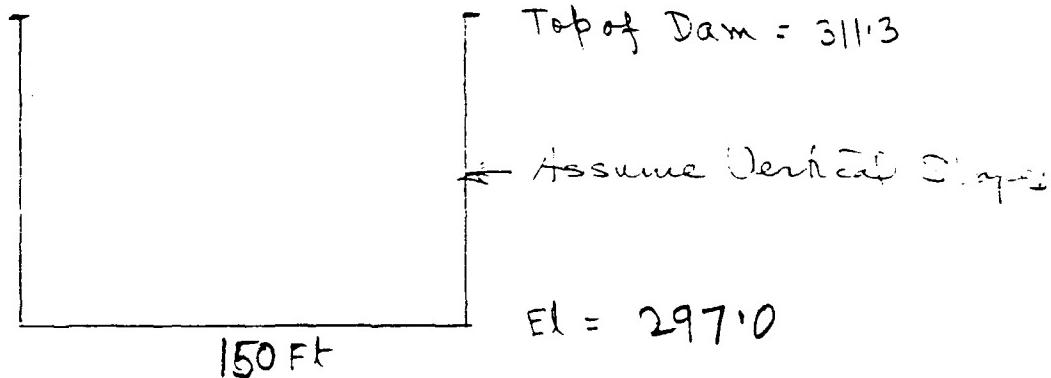
SUBJECT N.J. Dam Inspection
Schneller Pond Dam
COMPUTED BY S.B. CHECKED BY

SHEET NO. 10 OF
 JOB NO. 11-1176-C1
 DATE Feb, 1981

BREACH ANALYSIS

Assume breach begins to develop when reservoir stage reaches above the dam

Time of Failure = 16.25 hrs.



Effect of breach was analysed at 800 ft D/S of Dam

Max. Stage without Dam break = 285.1

Max. Stage with Dam break = 285.7.

0.6 feet increase @ 0.4 PMP

Effect of breach was also analysed at 2000ft D/S

Max. Stage without Dam break = 271.7

Max. Stage with Dam break = 272.5

There will be 0.8 ft increase in stage due to Dam break at 0.4 PMP

PRC Harris, Inc.
CONSULTING ENGINEERS

SUBJECT: N.J. Dam Inspection
SCHILLER POND DAM
COMPUTED BY: S.B. CHECKED BY:

SHEET NO. 11 - OF
JOB NO. 1C 1176-C.L.
DATE Feb, 1961

Drawdown time Computation

$$EI = 305$$

When the gate is open
Normal elevation to
Start = 305.0

$$\text{Inflow} = \frac{2 C S}{A} \times 1.37 = 274$$

(184)

$$299.5$$

$$Q = CA \sqrt{2gh} \quad C = 0.62 \\ A = \frac{\pi}{4} \times 1.5^2 \\ \approx 8.8 \sqrt{h}$$

Assume Tailwater Elec. = 299.5 FT

$$A_2 = \left(\frac{h_2}{h_1}\right)^2 A_1 = \left(\frac{h_2}{11}\right)^2 \times 5.5 = 1045 h_2^2 \quad A_1 = 5.5 \\ h_1 = 11$$

$$\text{Drawdown time} = \frac{\text{Vol in AF} \times 43560}{Q \times 3600} = 12.1 \frac{\text{Vol}}{Q}$$

EI	Area ft ²	Avg head ft	Avg Vol AF	Q cfs	$\frac{Q}{A}$ ft/s	Drawdown Line $\frac{V}{\sqrt{h}} \times 1.21$	Cum time hrs	Drawdown with inflow hrs	
								Cum time hrs	Cum time hrs
305	5.5		5.0	5.0	1.8	3.7	3.7	4.3	3.5
304	4.5		4.05	4.05	1.76	2.31	5.86	4.4	6.75
303	3.65		3.27	3.27	1.52	2.60	5.45	4.7	9.82
302	2.88		2.54	2.54	1.24	2.56	4.04	5.7	12.95
301	2.20		1.91	1.91	1	2.71	3.75	6.6	16.5
300	1.62		1.47	1.47	0.75	4.4	2.13	1.12	19.95
299.5	1.36								

Time of drawdown without inflow = 15.33 ≈ 16 hrs.
Time of drawdown with const. inflow = 20 hrs.

12

JOBS FOR DAY 1
SCHEDULING INFORMATION
POST SCHEDULING

AS OF 7/17/77 7:19:11

JOBS SCHEDULED FOR DAY 1
SCHEDULING PERIOD
POST SCHEDULING

JOID	SPECIFICATION	IPMT	IPAT	NSTAN
1008	1AY	0	0	0
1100	1B	0	0	0
1200	1C	0	0	0
1300	1D	0	0	0
1400	1E	0	0	0
1500	1F	0	0	0
1600	1G	0	0	0
1700	1H	0	0	0
1800	1I	0	0	0
1900	1J	0	0	0
2000	1K	0	0	0
2100	1L	0	0	0
2200	1M	0	0	0
2300	1N	0	0	0
2400	1O	0	0	0
2500	1P	0	0	0
2600	1Q	0	0	0
2700	1R	0	0	0
2800	1S	0	0	0
2900	1T	0	0	0
3000	1U	0	0	0
3100	1V	0	0	0
3200	1W	0	0	0
3300	1X	0	0	0
3400	1Y	0	0	0
3500	1Z	0	0	0
3600	1AA	0	0	0
3700	1AB	0	0	0
3800	1AC	0	0	0
3900	1AD	0	0	0
4000	1AE	0	0	0
4100	1AF	0	0	0
4200	1AG	0	0	0
4300	1AH	0	0	0
4400	1AI	0	0	0
4500	1AJ	0	0	0
4600	1AK	0	0	0
4700	1AL	0	0	0
4800	1AM	0	0	0
4900	1AN	0	0	0
5000	1AO	0	0	0
5100	1AP	0	0	0
5200	1AQ	0	0	0
5300	1AR	0	0	0
5400	1AS	0	0	0
5500	1AT	0	0	0
5600	1AU	0	0	0
5700	1AV	0	0	0
5800	1AW	0	0	0
5900	1AX	0	0	0
6000	1AY	0	0	0
6100	1AZ	0	0	0
6200	1AA	0	0	0
6300	1AB	0	0	0
6400	1AC	0	0	0
6500	1AD	0	0	0
6600	1AE	0	0	0
6700	1AF	0	0	0
6800	1AG	0	0	0
6900	1AH	0	0	0
7000	1AI	0	0	0
7100	1AJ	0	0	0
7200	1AK	0	0	0
7300	1AL	0	0	0
7400	1AM	0	0	0
7500	1AN	0	0	0
7600	1AO	0	0	0
7700	1AP	0	0	0
7800	1AQ	0	0	0
7900	1AR	0	0	0
8000	1AS	0	0	0
8100	1AT	0	0	0
8200	1AU	0	0	0
8300	1AV	0	0	0
8400	1AW	0	0	0
8500	1AX	0	0	0
8600	1AY	0	0	0
8700	1AZ	0	0	0
8800	1AA	0	0	0
8900	1AB	0	0	0
9000	1AC	0	0	0
9100	1AD	0	0	0
9200	1AE	0	0	0
9300	1AF	0	0	0
9400	1AG	0	0	0
9500	1AH	0	0	0
9600	1AI	0	0	0
9700	1AJ	0	0	0
9800	1AK	0	0	0
9900	1AL	0	0	0
10000	1AM	0	0	0
10100	1AN	0	0	0
10200	1AO	0	0	0
10300	1AP	0	0	0
10400	1AQ	0	0	0
10500	1AR	0	0	0
10600	1AS	0	0	0
10700	1AT	0	0	0
10800	1AU	0	0	0
10900	1AV	0	0	0
11000	1AW	0	0	0
11100	1AX	0	0	0
11200	1AY	0	0	0
11300	1AZ	0	0	0
11400	1AA	0	0	0
11500	1AB	0	0	0
11600	1AC	0	0	0
11700	1AD	0	0	0
11800	1AE	0	0	0
11900	1AF	0	0	0
12000	1AG	0	0	0
12100	1AH	0	0	0
12200	1AI	0	0	0
12300	1AJ	0	0	0
12400	1AK	0	0	0
12500	1AL	0	0	0
12600	1AM	0	0	0
12700	1AN	0	0	0
12800	1AO	0	0	0
12900	1AP	0	0	0
13000	1AQ	0	0	0
13100	1AR	0	0	0
13200	1AS	0	0	0
13300	1AT	0	0	0
13400	1AU	0	0	0
13500	1AV	0	0	0
13600	1AW	0	0	0
13700	1AX	0	0	0
13800	1AY	0	0	0
13900	1AZ	0	0	0
14000	1AA	0	0	0
14100	1AB	0	0	0
14200	1AC	0	0	0
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14400	1AE	0	0	0
14500	1AF	0	0	0
14600	1AG	0	0	0
14700	1AH	0	0	0
14800	1AI	0	0	0
14900	1AJ	0	0	0
15000	1AK	0	0	0
15100	1AL	0	0	0
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15300	1AN	0	0	0
15400	1AO	0	0	0
15500	1AP	0	0	0
15600	1AQ	0	0	0
15700	1AR	0	0	0
15800	1AS	0	0	0
15900	1AT	0	0	0
16000	1AU	0	0	0
16100	1AV	0	0	0
16200	1AW	0	0	0
16300	1AX	0	0	0
16400	1AY	0	0	0
16500	1AZ	0	0	0
16600	1AA	0	0	0
16700	1AB	0	0	0
16800	1AC	0	0	0
16900	1AD	0	0	0
17000	1AE	0	0	0
17100	1AF	0	0	0
17200	1AG	0	0	0
17300	1AH	0	0	0
17400	1AI	0	0	0
17500	1AJ	0	0	0
17600	1AK	0	0	0
17700	1AL	0	0	0
17800	1AM	0	0	0
17900	1AN	0	0	0
18000	1AO	0	0	0
18100	1AP	0	0	0
18200	1AQ	0	0	0
18300	1AR	0	0	0
18400	1AS	0	0	0
18500	1AT	0	0	0
18600	1AU	0	0	0
18700	1AV	0	0	0
18800	1AW	0	0	0
18900	1AX	0	0	0
19000	1AY	0	0	0
19100	1AZ	0	0	0
19200	1AA	0	0	0
19300	1AB	0	0	0
19400	1AC	0	0	0
19500	1AD	0	0	0
19600	1AE	0	0	0
19700	1AF	0	0	0
19800	1AG	0	0	0
19900	1AH	0	0	0
20000	1AI	0	0	0
20100	1AJ	0	0	0
20200	1AK	0	0	0
20300	1AL	0	0	0
20400	1AM	0	0	0
20500	1AN	0	0	0
20600	1AO	0	0	0
20700	1AP	0	0	0
20800	1AQ	0	0	0
20900	1AR	0	0	0
21000	1AS	0	0	0
21100	1AT	0	0	0
21200	1AU	0	0	0
21300	1AV	0	0	0
21400	1AW	0	0	0
21500	1AX	0	0	0
21600	1AY	0	0	0
21700	1AZ	0	0	0
21800	1AA	0	0	0
21900	1AB	0	0	0
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22100	1AD	0	0	0
22200	1AE	0	0	0
22300	1AF	0	0	0
22400	1AG	0	0	0
22500	1AH	0	0	0
22600	1AI	0	0	0
22700	1AJ	0	0	0
22800	1AK	0	0	0
22900	1AL	0	0	0
23000	1AM	0	0	0
23100	1AN	0	0	0
23200	1AO	0	0	0
23300	1AP	0	0	0
23400	1AQ	0	0	0
23500	1AR	0	0	0
23600	1AS	0	0	0
23700	1AT	0	0	0
23800	1AU	0	0	0
23900	1AV	0	0	0
24000	1AW	0	0	0
24100	1AX	0	0	0
24200	1AY	0	0	0
24300	1AZ	0	0	0
24400	1AA	0	0	0
24500	1AB	0	0	0
24600	1AC	0	0	0
24700	1AD	0	0	0
24800	1AE	0	0	0
24900	1AF	0	0	0
25000	1AG	0	0	0
25100	1AH	0	0	0
25200	1AI	0	0	0
25300	1AJ	0	0	0
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25500	1AL	0	0	0
25600	1AM	0	0	0
25700	1AN	0	0	0
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25900	1AP	0	0	0
26000	1AQ	0	0	0
26100	1AR	0	0	0
26200	1AS	0	0	0
26300	1AT	0	0	0
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26500	1AV	0	0	0
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29200	1AW	0	0	0
29300	1AX	0	0	0
29400	1AY	0	0	0
29500	1AZ	0	0	0
29600	1AA	0	0	0
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WILLIAM HENRY FORTIN
SCHLESINGER
ON THE POLITICAL

100 *SCIENTIA*

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THE JOURNAL OF PRACTICAL PHILOSOPHY

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1000 6000 2000

JO: SPECIFICATION
BDR: DATA PLAC: IPBLF: IPRT: NESTAN
0 0 0 0 0 0
NUT: LATCH TRACE
0 0 0 0

ANALYSIS TO BE PERFORMED
IN WHICH I LATICE 1

DATA REQUEST COMPUTATION

REFCON	TYPE	JLT	JPRI	I NAME	I STAGE	I ATRG
0	0	0	0	0	0	0

MY PROGRAM DATA

ISSQN	INSPC	SATNO	I NAME	I STAGE	LOCAL
1.37	6.50	0.0000	0	0	0

FREE TOP DATA

R12	R24	R43	R72	R90
104.00	117.00	0.00	0.00	0.00

LOSS D TA

TA	STRL	CUSL	ALSMX	Q1IMP
0.00	1.00	1.00	0.00	0.00

INIT HYDROGRAPH DATA

DATE	0.0
0.00	2.00

RECESSION DATA

CRETIME	-0.005	RTTDE	2.00
0.00	0.00	0.00	0.00

END OF COMPUTATION

Count	SCDA	req. out	ret. 10^7	HALT	ERR	LOG	COPIED
1	1.01	12.4	51	0.52	0.50	0.00	179.
2	1.01	11.0	52	0.52	0.50	0.00	1527.
3	1.01	15.1	53	0.52	0.50	0.00	1625.
4	1.01	15.5	54	0.52	0.50	0.00	1714.

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ארכיאולוג אפליגט ורונען

CHRONICLES OF THE CITY OF AFRICITY AND VICE-REGAL

INTRODUCTION

	MAXIMUM STAGE	TIME IN HOURS
MAXIMUM STAGE	215.0	16.50
MAXIMUM STAGE	215.7	16.50

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MAXIMUM
FALLING
STAGE - FT
3.74

21